Center for Integrated Pest Management (CIPM)

North Carolina State University

Managing pest species in agricultural environments requires judicious choices among chemical, biological, cultural, and mechanical controls

A National Science Foundation Industry/ University Cooperative Research Center since 1991

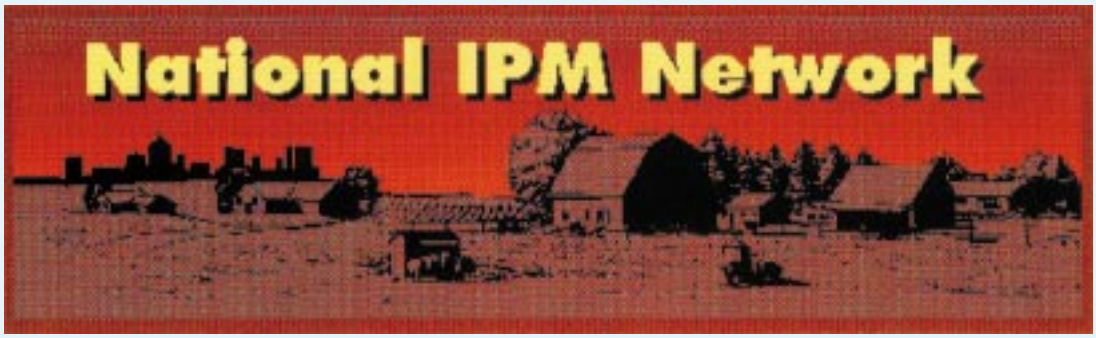
Center Mission and Rationale

The Center for Integrated Pest Management fosters pest management programs leading to a high level of knowledge of pest biology coupled with choices of control technology and monitoring tools which result in the most economically sound, environmentally compatible, and sociologically responsible integrated crop management and production. We seek to play a vital, national role in Integrated Pest Management (IPM) research, education, and training. The Center supports IPM through the evaluation of emerging technologies, information management and dissemination, environmental stewardship, estimation of economic consequences, resistance management tools and systems, and integration of disciplinary expertise in general.

Research Program

The Center's research program encompasses seven core areas:

- ***Impact of pest management on environmental quality*** — Research is under way to define the parameters that are important in determining the environmental impact of pest management practices. Once the appropriate factors have been identified and their importance ranked in some quantifiable manner, models can be developed to predict the potential impact of pest management decisions.
- ***Benefits assessment protocols and determination of economic thresholds*** — The ability to accurately assess benefits for specific IPM practices as well as potential crop losses from pest outbreaks is essential to successful IPM practice. Predictive data on crop loss are also needed when the Environmental Protection Agency conducts risk/ benefit analyses in pesticide registration cases.
- ***Genetic engineering for improved pest management*** — Recent advances in biotechnology — especially the ability to rapidly manipulate genetic traits among species — offer great potential in many areas of IPM. Two research subjects of high priority are whether crop plants and livestock can develop increased resistance to pests and whether biological control agents can be greatly improved.
- ***Improved understanding of pest biology and ecology*** — Proper management of many crop and livestock pests depends on the ability to predict if and when a particular pest species will cause a problem. Research designed to better understand the biology of pest species will aid in the development of specific management options that produce fewer adverse effects.
- ***Detection and management of pesticide resistance*** — Pesticides are and will continue to be a major method of pest control. One of the most common reasons that a pesticide ceases to be useful is the development of chemical resistance by the target pest. Research programs designed to understand pesticide resistance at the molecular level and at the pest population level will help to delay or even avoid this phenomenon.
- ***Development of decision support systems for IPM***— IPM decision makers (farmers, consultants, extension agents, and chemical distributors) make complex decisions that may have grave economic consequences. Many times the factors that must be considered are so numerous that it is not humanly possible to properly assess them all. Computer technology gives IPM decision makers the computational speed necessary to consider all the factors that impact a decision and to evaluate multiple scenarios. Developing decision support software for IPM will be one of the Center's major research components.



The National IPM Network will provide timely and accurate pest management information, available 24 hours a day, to farmers and home gardeners alike.

Rapid detection of resistance to pesticides is the key to avoiding the application of chemicals that will not be effective in reducing pest numbers.

In many cases the field is the best laboratory for teaching new IPM technology and demonstrating results in real time.

- ***Electronic information transfer*** — This is a prerequisite for modern IPM technologies. The Center for IPM is at the forefront of developing and promoting IPM information provision on the Internet's Wide World Web. Inexpensive, accurate, and timely information transfer to growers, consultants, and retailers, together with provision of decision aids, is critical to IPM acceptance and use. The National IPM Network, founded by the Center, now includes a national server at the USDA, four regional servers, and numerous state cooperators.

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